

**YUKON-CHARLEY RIVERS NATIONAL PRESERVE**

**CENTRAL ALASKA NETWORK**

**Vegetation Monitoring Program**

**Summary Trip Report: Middle Crescent Mini-grid**

**1 July – 10 July, 2009**



Photo 1: Middle Crescent mini-grid looking south-west with grid points displayed. Camp is just beyond view to the lower right.

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## **PURPOSE:**

The purpose of this trip was to install and measure permanent vegetation plots at 25 points on the Middle-Crescent mini-grid as part of the ongoing monitoring program in Yukon-Charley Rivers National Preserve. Our work followed the protocols developed by the Central Alaska Network (CAKN) long term vegetation monitoring program (see Roland *et al.* 2005). This was the fourth season of plot installation at Yukon-Charley Preserve.

## **PERSONNEL:**

Pete Del Zotto—Crew lead; plot and quadrat variable estimates; vascular plants collections and tentative field identifications; transect recorder

Haig Diradourain—transect reading; plot photography; tree and sapling measuring; tree coring.

Kara Thies—soil observations and sampling; non-vascular composition and collections

## **ACCESS TO MINI-GRID AND CAMPING POSSIBILITIES:**

### *Access*

The Mid-Crescent mini-grid is in the south-west portion of Yukon-Charley Preserve within 3 kilometers of the park boundary. Access to this area required two flights: 1) a fixed-wing flight from Fairbanks into the Preserve at the Coal Creek airstrip and 2) a helicopter flight south for 25 minutes to the field site. The fixed wing portion was a chartered flight through Wright Air Service using a Cessna 206 aircraft. The crew arrived at the Fairbanks airport at 9:30 am, departed just after 10 am and landed at Coal Creek about 11:30 am, with the actual flight time being about 1 hour and 10 minutes.

The helicopter flight to the field site lasted 25 minutes with the first personnel arriving at the field site at 1:30 pm. A Hughes 500 aircraft was used. With its limited storage capacity, three round-trips from Coal Creek to the field site were needed in order to transport all personnel and gear. The initial flight landed us at the field site at 1:30 pm. Later flights of gear were delayed; a separate crew was also using the helicopter to reach their field site. The final flight with remaining equipment arrived at 6:00 pm.

### *Camping*

The campsite was established on the east side of Crescent Creek just north of the mouth of the small stream closest to point 17. Tents were pitched on a bluff about 50 meters back from the creek. The dining area was put to the north, adjacent to the creek about 75 meters away. Camp coordinates: 64.8928 N, 143.9956 E



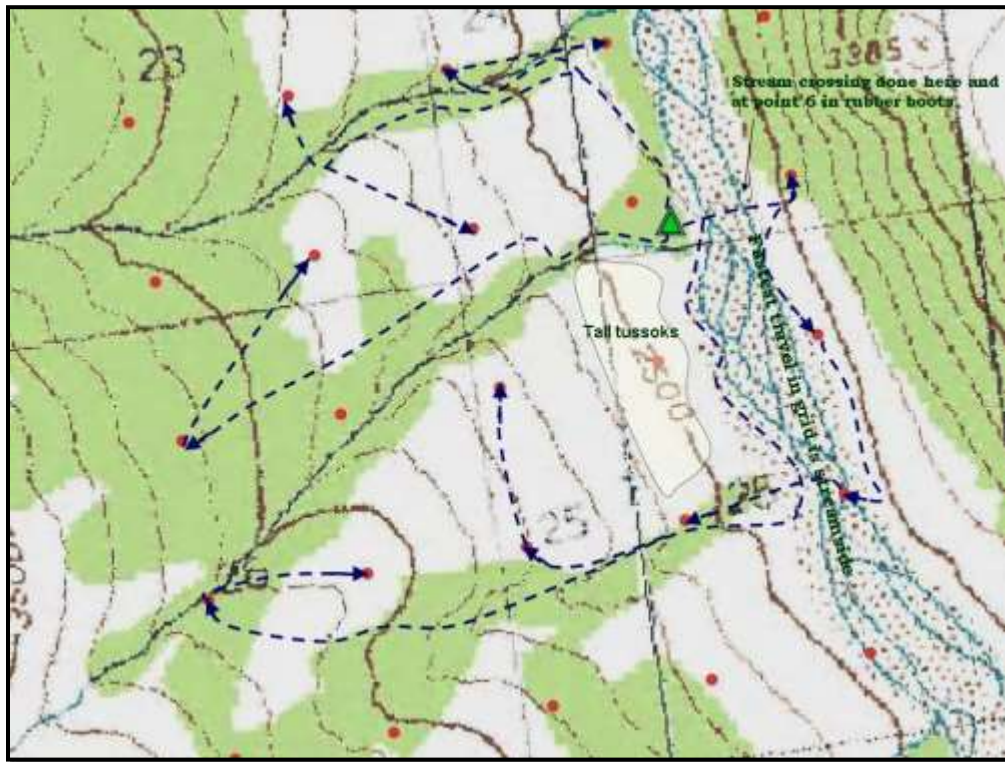
Photo 2: Camp, looking north-east. Tents were pitched on a bluff above Crescent Creek. View of the kitchen area, adjacent to stream, is blocked by the spruce tree on far left.

Other possible camping is uphill to the south and southwest, higher along the stream that is nearest to the 2009 camp. This would be a more central location within the grid. It would require a bit more work finding suitable tent sites (hummocks), plus it lacks the mosquito-clearing breezes that occur along the main channel of Crescent Creek.

### **HIKING:**

Travel is fairly easy and quick in this study area. Aside from the north-south corridor of Crescent Creek, three east-west drainages run through the grid also. For us, these smaller drainages functioned as travel routes to most points. All three of these drainages had running water during our stay, despite the southern-most being depicted as dry on the USGS map.

Going north-south within the grid is most efficiently done along Crescent Creek. Traveling this direction along the east facing hillsides, especially lower down, is likely slowed by tussocks.



Map 1: Travel routes used in the Middle Crescent Creek grid. Drainages provided the most efficient travel.

Crossing Crescent Creek was possible in rubber boots near camp where the stream has many braids. None of these braids are particularly swift and after a little searching a route was found with water not exceeding the top of our boots. This was also true where we crossed near point 6.

Challenges in travel were mainly the tussock fields between the drainages. The tussock heights varied when returning to camp from point 13—the deepest we encountered are labeled in Map1. Tussocks to the south and west of there were not large enough to seriously inhibit travel. Also slowing travel a little bit was climbing through the soft, moss covered ground. It's great on the knees, but makes for little extra work ascending hills.

## **WEATHER AND ENVIRONMENTAL CONDITIONS:**

The weather here was the hottest our crew experienced in 2009. There was no significant precipitation, but humidity at times was dreadful. Typical morning lows were in the 40s and days warmed rapidly. Late mornings were in the mid-70s often with high humidity. Most afternoons had at least some cloudiness; there was even a thunderstorm. Highest

temperatures were likely in the 80s although a soil thermometer in the shade registered 94 degrees one afternoon. The first major thunderstorms of the summer occurred the evening of July 5. Numerous fires across the state were ignited. Among the highest strike concentrations was in the Crescent Creek drainage and smoke was in the air for the remainder of our stay.

Mosquitoes were thick for the entire trip. White-sox and biting flies were present only in small numbers. About every other evening there was a small breeze along Crescent Creek that curtailed the mosquitoes somewhat. Dinner was normally consumed while wearing a head net.

Aufeis was present along Crescent Creek, in places covering thousands of square meters. It was necessary at times to travel across this remnant ice-pack. It was thin and fragile in spots and a few times collapsed under our weight, particularly in the afternoon. For safety the effort was made to stay off this ice, especially where it was above running water.

### **SAFETY CONSIDERATIONS:**

The satellite phone was the sole means of communication. Future crews be sure and take the cables needed to charge the satellite phone batteries. Radio communication was absent—it wasn't possible to hit a repeater from the highest elevation plots.

With the heat, plenty of water was essential, and fortunately there was accessible water everyday. Some days I survived on two liters but not without stopping at a creek and dunking my head and cooling off when possible. I also carried water purification which I used on the warmest days. The other crew members carried a minimum of three liters of water.

Placing our kitchen on the edge of Crescent Creek raised discussion of a couple topics: 1) The creek is likely an animal travel corridor. An animal coming upon the kitchen could become curious and ransack the place. To mitigate this somewhat, we stored food canisters about 20 or 30 meters from where we ate, on the stream bank. 2) If it rained hard the stream could rise and wash away some of our kitchen. The kitchen tent was placed on a small rise—an island—to get it at least a couple feet above water level.

The furthest south of the east-west drainages is thick with willow. This would be a scary place to flush a bear, so constant chatter and accessible bear spray was especially important.

### **PHENOLOGY OBSERVATIONS:**

Timing of this visit in regards to phenology was excellent. About 2/3 of the vascular species were either in bloom or in fruit.



## GENERAL NOTES ON PLOT-WORK AND PLOT OBSERVATIONS:

Fourteen plots were completed during a stay of nine days. The visit was shortened because helicopter transportation was available only on day 9, not day 10. Potentially twenty plots on this grid could be completed by a crew if given a 10-day visit that also allowed some work to be completed on days 1 and 10. On this visit, travel complications prevented any plot work on both the first and last day.



Photos 3 & 4: Typical communities in the Middle Crescent Grid. Spruce woodlands and open forest, left; graminoid dominant slopes (*Eriophorum* sp., *Carex bigelowii*), right.

### Wildlife

Caribou were seen twice. In the early evening of day 2 or 3 a lone caribou crossed Crescent Creek near camp from east-to-west, continuing up the hill along the nearby secondary stream. Another sighting of a lone caribou was made while on plot 15 during day 6. No other large animals were observed.

Table 1: Collection series for the Middle Crescent grid:

Collector	Identifier	Series
Del Zotto	Vascular collections (55)	PDZ-09-81 to PDZ-09-135
Diradourian	Digital Photos (241)	100-227 to 100-467
Diradourian	Tree Cores (36)	
Thies	Soils	16 samples
Thies	Nonvascular collections (121)	KT-09-001 to KT-09-121, KT-09-213 and KT-09-214

## ACTIVITES:

Table 2: Synopsis of activities on the Middle Crescent grid:

Date	Grid day	Activity
July 1	1	Fly Fairbanks to Coal Creek; Coal Creek to Middle Crescent field site; establish camp
July 2	2	Complete points 21 and 11
July 3	3	Complete points 6 and 7
July 4	4	Complete points 10 and 9
July 5	5	Complete points 8 and 13
July 6	6	Complete points 15 and 19
July 7	7	Complete points 24 and 18
July 8	8	Complete points 23 and 22
July 9	9	Helicopter flight directly to Fairbanks

### Day1: Wednesday, July 1

#### Travel

The crew arrived at Coal Creek airstrip at about 11:30 am via a Cessna 206 from Fairbanks. Another flight arrived within 15 minutes that carried cultural resource personnel, who required helicopter transportation to their field site. The helicopter use between both groups was scheduled for the day and shuttling began. All vegetation gear and personnel arrived by 6:00 pm at field site.

### Day 2: Thursday, July 2

#### Points 21 & 11

Since this visit was scheduled for 9 days rather than 10 the chance of completing all 25 points was minimal. Therefore the furthest points (1-5) were eliminated as candidates to visit unless the remaining 20 points were completed before our departure. Today's goal was to complete points 21 and 16.

*Point 21:* Tree density decreases as one goes north of here, with shrubs becoming a mix of *Salix*, *Betula occidentalis* and *Alnus viridis ssp. fruticosa*. Very little *Betula nana* on this hillside

With the late hour, the crew bypassed point 16 and went to point 11. This point appeared the quicker of the two to complete given much of it was in water.

*Point 11:* This plot is centered in a channel toward the east side of Crescent Creek where the stream is wide with many braids. Travel along the east bank of the stream was direct and easy. Each quadrant in the plot has some vegetated ground. No stake or monument was placed at point center (in the water). This location receives frequent floods but the larger shrubs indicate vegetation is not entirely removed annually.

*Weather:* Clear, moderate humidity, highs low 70s.



Photo 5: View of point 11. Points 6 and 11 fall directly in the Crescent Creek flood plain and both include small islands.

### Day 3: Friday, July 3

### Points 6 & 7

*Point 6:* From camp the crew crossed Crescent Creek and walked south along the east side, navigating to point 6 from the east. The point center is in the creek. A small portion of land and vegetation in the 8 meter radius is the edge of a small island. This sliver of ground is open tall willow (*Salix richardsonii*) with a shrub layer dominated by *Vaccinium uliginosum* with a small amount of *Potentilla fruticosa*. The sedge PDZ-09-91 is prominent. The island is about .5 meters above water level.

Both points 6 and 11 were hard to classify in terms of a Viereck polygon. The census water classification requires a continuous 61 meters of water. Nowhere does this exist in Crescent Creek, however the entire floodplain exceeds 61 meters.

*Point 7:* The travel from point 6 directly to point 7 was straightforward. The final stream channel (most westerly) was as deep as a rubber boot—4 out of our 6 feet got wet in the crossing. The plot is in a white spruce stand with most trees having sickly thin crowns and much dead material. Estimated live crown on the plot is about 20%. These trees were identified as white spruce but some have a very few, tiny hair-like features where the petiole meets the stem. Shrub layer is minimal, about 15% cover, of mainly *Salix pulchra*, *Betula nana* and *Vaccinium uliginosum*.

*Weather:* Humid morning, partly cloudy afternoon, high in the 80s.



**Day 4: Saturday, July 4****Points 10 & 9**

Travel from camp to point 10 was done on the edge of Crescent Creek to avoid the hillside tussocks. We approached the plot from about 260 degrees via the furthest drainage south in the grid. The lower ½ of this drainage has less obstructed travel than the upper ½. We exited the drainage somewhere between points 8 and 9, then climbed the E-W ridge and veered toward point 10.

*Point 10:* the point is located in the bottom of a dry gulley that is about 15 meters from a stream. The gulley is likely an old stream channel. The position is ecotonal, with a large dwarf-birch area to the east (which contains point center), a white spruce woodland to the west, and also a stringer of willow that hugs the creek's edge, about 10-15 meters wide. The willow segment contains 10% cover of spruce, so is considered spruce woodland despite its distinct appearance.

Travel to point 9 was in open and gentle terrain—very easy.

*Point 9:* The point lies on a broad N-S ridge with a very few spruce and 40-50% cover of dwarf-birch. The area is somewhat exposed to wind but with little evidence of it on the vegetation (other than its generally dwarf stature?). Several nearby trees have an unusual form with live branch whorls at the base; the bole above these whorls is branch-free for a few feet, then more live healthy whorls are above that.

*Weather:* Humid morning, afternoon thunder head build up with light sprinkles, high in the 80s.

**Day 5: Sunday, July 5****Points 8 & 13**

The plan was to complete plots 8, 13 and possibly 12 today. Two dead satellite phone batteries delayed the morning check-in with dispatch and contributed to a late start. The route to point 8, south along Crescent Creek then up the hillside from the east isn't recommended because of tussocks. It's best to travel the drainage that was used to access point 10.

*Point 8:* This is near a transition between an open white spruce forest and a low-shrub community. The entirety of the plot falls in the shrub community. A slight change of aspect may be influencing what community is present—it seems a bit more easterly aspect favors the spruce community.

*Point 13:* Travel from point 8 is very quick with only small hummocks to navigate; about 10 minutes. This is another point on the broad, low angle valley hillside above Crescent Creek. Very few conifers are here and plant stature is small. *Alnus viridis* is the only plant exceeding 30 cm. A rather exposed site. Returned to camp via the E-W drainage to the north of here as this route avoids the tussocks.

*Weather:* Humid morning, thunder head build-up, cloudy by 2 pm with light shower.

**Day 6: Monday, July 6****Points 15 & 19**

Travel to point 15 was done following the E-W drainage nearest to camp for about 200 meters, then heading slightly north to climb the adjacent ridge, then resuming a W-SW direction toward point 15. The initial northerly move helps get above a cliff area in the drainage. The remaining travel is through a mix of dwarf-birch and willow with small hummocks; further along through a spruce stand with hummocks.

*Point 15:* This is an open white spruce stand with most trees in some state of decline or mortality with thin crowns. Willow (~1.5 meters) and dwarf-birch (~1 meter) cover about 35%, collectively. About 100 meters north the Viereck type changes to a shrub type of tall willow and dwarf-birch as the spruce component decreases to < 10% cover. A lone caribou walked to within about 30 meters of plot.

With a late finish to point 15, point 19 appeared to be the nearest point to complete the most quickly (i.e. fewest trees). The travel was easy without tussocks from 15.

*Point 19:* This point straddles a transition from forest (to the SW) to woodlands and shrublands to the NE. The dense forest to the SW might be associated with the stream which comes within ~ 30 meters of point 19. Between the dense forest and shrublands is a band of forest >35 meters wide with about 10-25% conifer cover. The plot is on a slightly convex slope, near where the aspect changes slightly toward the NE running stream.

Return to camp done by descending to the east and veering SE for a few hundred meters to find the drainage that leads right back to camp.

**Day 7: Tuesday, July 7****Points 24 & 18**

A slightly shorter day was scheduled for some rest for the crew. Travel to point 24 took about 1 hour first by heading north from camp in the woods for about 200 meters then veering NNW to catch a secondary drainage which was then followed WSW for about 300 meters. From here almost a direct line was followed to 24. Pretty good travel with modest tussocks.

*Point 24:* The area has 20-25% spruce cover which increases (corresponding to a steepening hillside) to the south. The Viereck type, 1A3C, covers just about 10,000 sq. meters as the tree cover thins to <10% cover to the north. Small amounts of standing water are on the point. Travel from point 24 to point 18 was easy, made in a direct line and even included a small stream to cool off at.

*Point 18:* The point is in an area that is graminoid dominated and also with about 25 % low shrub cover. A few white spruce are sprinkled in the immediate area. The hillside is a constant 6-8 degree drop the NE for ~ 200 meters and ends at a tree-less bench above Crescent Creek. Return hike to camp took about 15 minutes.

*Weather:* Morning inversion with smoke and clouds, clearing for a pleasant afternoon; high about 70.



Photo 6: Our Limo service. Kara, Haig and manager Dave Kreuzer (center) just before take-off to Fairbanks on day 9. All three crew members plus gear were accommodated in one flight.

### **Day 8: Wednesday, July 8**

### **Points 23 & 22**

Plan was to complete points 23 and 22. Travel to point 23 from camp involved initially heading north until reaching the E-W drainage that runs closest to point 23. This was followed to the west through the spruce forest to 23. About 30 minutes from camp.

*Point 23:* This is on a moss covered shallow ridge and is somewhat dry. A small drainage is below (south) of the point. The hillside above this drainage contains both spruce and aspen, with the densest cover in the bottom and gradually thinning tree cover upwards (north) on the hill. Point 23 is located where this hillside flattens. Continuing north the forest transitions into a closed shrub community. The point falls between the forest and shrub communities, and has right about 10% tree cover. There is little diversity in vascular and non-vascular plants, and the trees appear healthy with full crowns.

Travel to point 22 took about 10-15 minutes and included a small stream that was used for a quick cool-off.

*Point 22:* This is at the east edge of a low shrub community. It is on top of a small ridge and contains less than <10% spruce cover. Return hike to camp about 10-15 minutes by heading downhill and following the spruce cover to camp.

*Weather:* Clear, high in the 70s, afternoon cloudiness.

### **Day 9: Thursday, July 9**

### **Travel**

The helicopter originally scheduled to us was unavailable—dispatched to a fire in Wrangell St.-Elias National Park. After several satellite phone calls we were informed our transportation would be provided by a search-and-rescue helicopter from Denali National Park, which arrived about 11:15 am. The flight was direct to Fairbanks and arrived about 1:00 pm. The cloudy weather obscured many of the higher ridges in the park and forced several diversions in the return flight, which eventually followed the Chena River drainage.

### **CONCLUSIONS AND FUTURE CONSIDERATIONS:**

Of the four grids visited in Yukon-Charley in 2009, this one provided the smoothest logistics. The production reflected this—14 completed points in what amounted to 7 days of work. Of course additional plots would have been completed had 10 days rather than 9 been available. But it's important to attempt making the first and/or the last day (the "travel" days) productive. This is especially true in Yukon-Charley where travel days are significant (it's far from Fairbanks) and further complicated by the use of multiple transportation modes (drive/plane/helicopter, drive/boat/hike, etc.).

Day one of this trip was compromised when the transportation needs of another field crew forced a re-scheduling of helicopter use in the afternoon. In retrospect, having at least 2 people and sampling gear—even if not a complete set—dropped-off on the first flight would have been a better decision. Within 200 meters of camp was a point where sampling could have started.

How a crew packs can make a difference here. Helicopters will transport people only if they bring along some minimum "survival" gear like a tent, some food and a gun (bear defense). With these, an overnight stay is better endured on the chance the chopper can't return soon due to some unfortunate circumstance. Often this type of equipment is not packed with any sampling gear. I recommend packing in a manner that includes both some sampling gear and survival gear for that first trip. This at least provides the option of starting a plot if there's a long time between helicopter deliveries.

### **REFERENCES CITED:**

Roland, C.A., Oakley, K., Debevec, E. & Loomis, P. (2005) Monitoring vegetation structure and composition at multiple spatial scales in the Central Alaska Network. National Park Service, Central Alaska Network, Final Monitoring Protocol.